



STA 4853/5856

Spring 2016

Time Series/Forecast

UNIVERSITY of  
**FLORIDA**

Section 1H77/1H78 MWF 3rd period 09:35-10:25 FLO 100

**Instructor:** Demetris Athienitis

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**Course Website:** e-Learning

**Course Communication:**

- Piazza Q&A discussion forum.
- Office hours (posted on Canvas under “Pages”): There will be no office hours during holidays.
- E-mail for questions regarding course policies. (Ensure that **4853** or **5856** is in the subject line. Failure to do so may result in a non-response.)

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussion and chats. Please refer to expected class netiquette.

The instructor reserves the right to update any parts of this syllabus as necessary.

Students will promptly be notified of any changes.

**Required Text(s):** *Time Series Analysis and Its Applications With R Examples*, Third Edition (and link to companion site).

**Author(s):** Robert H. Shumway, David S. Stoffer

**ISBN:** 978-1-4419-7864-6 (Print), 978-1-4419-7865-3 (Online)

**Optional Text:** *Time Series Analysis: Univariate and Multivariate Methods*, 2nd edition (2005), by William W.S. Wei.

**Course Description:** Stationarity, autocorrelation, ARMA models; frequency domain methods and the spectral density; forecasting methods; and computationally-oriented application to case studies.

**Prerequisite(s):** STA 4210 and STA 4321

**Credit Hours:** 3

**Software:** You will need a computer for the homework assignments and practise. Some introductory lessons will be provided but students are expected to familiarize themselves with the software they wish use. The software used in class will be R (<http://www.r-project.org/>). For more help visit <http://www.stat.ufl.edu/~athienit/software.html>

**Purpose of Course:** To comprehend basic concepts of time series and autocorrelated responses, and learn how to build time series models and how to apply the models to real world problems.

**Topics:**

1. Fundamental concepts of time series and autocorrelated responses
2. AR, MA, ARIMA, and SARIMA Models
3. Forecasting
4. Model Identification
5. Parameter Estimation
6. Intervention Analysis
7. Unit Root Testing and Cointegration
8. ARCH and GARCH Models (time permitting)
9. Spectral Domain (time permitting)
10. State Space Models and the Kalman Filter (time permitting)

## Course Policies

### Assignments

- Students are expected to work independently, unless otherwise specified. **Offering and accepting** solutions from others is an act. of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor or teaching assistant.
- **No late assignments will be accepted under any circumstances.**
- Students are expected to show and explain how the answers were obtained.
- All electronically **submitted work must be in pdf format**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.

### Homework/Quizzes

There will be homework assigned on a regular basis as *suggested homework* containing data, analysis problems and/or book exercises. Information will be provided on the class website.

A **random set of questions will be chosen (from the suggested homework and potentially altered slightly)** as a *timed* homework/quiz assignment, that may be a. closed notes quiz or a. homework submission. These assignments may be

- In-class (closed notes).
- Online (Only 1 attempt.. It. is highly encouraged to use a. **reliable device** with a. **reliable wired ethernet internet connection**.

For online quizzes, **please allow yourself enough time to complete the quiz before the deadline. Failure to do so will result in your (unfinished current) attempt to be automatically submitted.** For the best preparation students are encouraged to complete the full suggested homework set and to have it scanned ahead of time.

### Exams

With every completion of 2 modules, exams will be administered that will comprise of multiple choice questions and possibly open-ended questions.

#### Important dates:

Exam #1 ..... February 10,2016  
 Exam #2 ..... March 16,2016  
 Exam #3..... April 27 at 08:30, 2016

#### Allowed material:

- Double sided, one page formula sheet of your own creation not to exceed the dimensions of 260mm by 330mm (normal letter sized page). Only formulas are allowed on the formula sheet. Failure to adhere to these conditions may result in failing the assignment. Provided is an example of a proper formula sheet.
- Scientific/Graphing Calculator.

## Grading

**Change of grade:** Grades will be changed only when an error has been made by the instructor.

#### Grade distribution:

Exams 1, 2 and 3        75% (15% lowest,30% highesttwo)  
 Homework/Quizzes 25% (lowest 1 score will be dropped)

#### Letter grade distribution:

		A    91 to 100	A-   87 to < 91	
B+	84 to < 87	B    80 to < 84	B-   77 to < 80	
C+	74 to < 77	C    70 to < 74	C-   67 to < 70	
D+	64 to < 67	D    60 to < 64	D-   55 to < 60	
E	< 55			

There will be *no rounding up* of scores. Students who actively participate in the discussion forum will be awarded **extra credit** (to the discretion of the instructor). To view the result of the letter grades to your GPA please visit

<http://www.registrar.ufl.edu/catalog/O11/policies/regulationgrades.html>

#### Make-up policy:

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.

- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the Academic Calendar

**Incomplete:** An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade. Instructors are not required to assign incomplete grades.

## Getting help

For issues with technical difficulties for e-learning in Canvas, please contact the UF Help desk at:

- <https://lss.at.ufl.edu/help.shtml> or <http://helpdesk.ufl.edu/>
- 352-392-4357 - select option 2
- e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

Any requests for make-ups due to technical issues MUST be accompanied by the **ticket number** received from LSS when the problem is reported to them. The ticket number will document the time and date of the problem. You MUST contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

**Complaints/Praises:** Should you have any complaints/praises with your experience in this course you can always address them to the instructor at [athienit@ufl.edu](mailto:athienit@ufl.edu), or you may contact Ms. Tina Greenly [t.greenly@ufl.edu](mailto:t.greenly@ufl.edu) of the Department of Statistics to submit a complaint. You may submit anonymous e-mail using:

- <http://anonymouse.org/anonemail.html> (No reply option, there is a time delay)
- <https://anonymousemail.me/> (Has optional reply option. Requires entry in the **From** field so put a fake address, e.g. [fake@fake.com](mailto:fake@fake.com))

Both of these sites have been tested and no personal information or IP addresses are available. Feel free to test them.

## UF Policies

**Accommodating Students with Disabilities:** Students requesting accommodation for disabilities must first register with the Dean of Students Office. The Dean of Students will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

**Academic Misconduct:** Students are held accountable to the UF Honor Code.